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Application Number

10/689,289

Filing Date

10/20/2003

First Named Inventor

James Edward Johnson

Art Unit

3746

Examiner Name

Tae Jun Kim

Attorney Docket Number

133476

### ENCLOSURES (Check all that apply)

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### SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name

Steven J. Rosen, Patent Attorney

Signature

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Steven J. Rosen

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August 10, 2006

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29,972

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

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Applicant: James Edward Johnson )	
Serial No: 10/689,289 )	Group Art Unit: 3746
Filed: 10/20/2003 )	Examiner: Tae Jun Kim
For: FLADE GAS TURBINE ENGINE )	
WITH FIXED GEOMETRY INLET )	

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Commissioner for Patents  
Alexandria, VA 22313-1450

AMENDED BRIEF OF APPELLANT

This is an appeal from the final rejection of the Examiner dated October 3, 2005 rejecting Claims 1, 3-5, 7, 8, 10-12, 14-22, 41, 43-45, 47, 48, 50-52, 54, 55, 57-59, 61, 63-65, 67, and 68. This Brief is accompanied by the requisite fee set forth in § 1.17(f).

REAL PARTY IN INTEREST

The real party in interest in this Appeal is the Assignee, General Electric Company, One River Road, Schenectady, New York 12345

EXTENT OF ASSIGNEE'S INTEREST

The extent of the interest in this invention that the assignee owns is the whole of this invention.

RECORDAL OF ASSIGNMENT IN USPTO

The assignment to the General Electric Company was recorded on October 20, 2003, Reel 014627, Frame 0981.

RELATED APPEALS AND INTERFERENCES

At this time, there are no interferences and no related appeals to this case known to the Appellant, the Appellant's legal representative, or the assignee which may or will directly affect or be directly affected by or may have a bearing on the Board's decision in this pending appeal.

STATUS OF CLAIMS

This application was originally filed with sixty-eight (68) claims of which two (2) were independent (Claims 1 and 20).

The Examiner, in a first Office Action dated as mailed May 27, 2005, issued a Restriction Requirement. The Applicant acknowledged the Restriction Requirement and provisionally elected with traverse to prosecute the invention of Group I which includes Claims 1, 3-22, 42-45, 47-48, 50-52, 54-55, 57-59, 61, and 63-68 which are illustrated in FIGS. 1-4. The Applicant's traversal included a statement that Independent Claims 1 and 48 are properly generic to all of their respective dependent Claims.

The Examiner, in a second non-final Office Action dated as mailed July 8, 2005, issued a corrected Restriction. The Examiner withdrew Claims 2, 6, 9, 13, 23-40, 42, 46, 49, 53, 56, 60, 62, and 66 for reasons stated in the Office Action.

The Examiner examined Group I which includes Claims 1, 3-5, 7, 8, 10-12, 14-22, 41, 43-45, 47, 48, 50-52, 54, 55, 57-59, 61, 63-65, 67, and 68 which are illustrated in FIGS. 1-4.

The Examiner, in the second Office Action rejected Claims 1, 3-5, 7, 8, 10-12, 14-22, 41, 43-45, 47, 48, 50-52, 54, 55, 57-59, 61, 63-65, 67, and 68 under 35 U.S.C. §103(a).

The Applicant filed a Response To Non-Final Office Action on August 16, 2005 amending Claims 7, 10, 14, 25, 29, 32, 36, 41, 50, 54, 57, and 67 and traversing all of the Examiner's rejections and overcoming the Examiner's grounds for the rejections under 35 U.S.C. §103(a).

The Examiner filed a Final Office Action dated as mailed October 3, 2005 in which the Examiner again rejected Claims 1, 3-5, 7, 8, 10-12, 14-22, 41, 43-45, 47, 48, 50-52, 54, 55, 57-59, 61, 63-65, 67, and 68 under 35 U.S.C. §103(a).

The Applicant filed a Response To Final Office Action on December 26, 2005 again traversing all of the Examiner's rejections and overcoming the Examiner's grounds for the rejections under 35 U.S.C. §103(a).

The Examiner filed an Advisory Action Before the Filing of an Appeal Brief dated as mailed January 11, 2006 notifying the Applicant that the Reply filed on December 26, 2005 failed to place the Application in condition for allowance.

The Applicant filed a Notice of Appeal and a Pre-Appeal Brief Request for Review on January 31, 2006.

A Notice of Panel Decision from Pre-Appeal Brief Review instructing the Applicant to proceed with filing an Appeal Brief to Board of Patent Appeals and Interferences was mailed on March 14, 2006. The status of the Claims are as follows.

Claims 1, 3-5, 7, 8, 10-12, 14-22, 41, 43-45, 47, 48, 50-52, 54, 55, 57-59, 61, 63-65, 67, and 68 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Johnson (5,404,713) in view of any of Tindell (5,447,283), Creasey et al. (2,956,759), Bullock (3,302,657), and Kerry et al. (2,940,692) and optionally in view of any of EP 0,567,277,A1, Krebs et al. (3,673,802) and Gruner (4,159,624).

Claims 1, 3-5, 7, 8, 10-12, 14-22, 41, 43-45, 47, 48, 50-52, 54, 55, 57-59, 61, 63-65, 67, and 68 stand rejected under 35 U.S.C. §103(a) as being unpatentable over EP 0,567,277,A1 in view of any of Tindell (5,447,283), Creasey et al. (2,956,759), Bullock (3,302,657), and Kerry et al. (2,940,692) and optionally in view of any of Johnson (5,404,713), Krebs et al. (3,673,802) and Gruner (4,159,624).

The status of the Claims as set out in the Final Office Action dated as mailed October 3, 2005 was and is as follows:

- allowed claims -- none
- claims objected to -- none
- claims rejected -- 1, 3-5, 7, 8, 10-12, 14-22, 41, 43-45, 47, 48, 50-52, 54, 55, 57-59, 61, 63-65, 67, and 68.

#### STATUS OF AMENDMENTS

There are no remaining unentered or proposed amendments.

SUMMARY OF CLAIMED SUBJECT MATTER

The Appellant's invention, as illustrated in FIGS. 1-6 and described starting on page 6, paragraph 18, line 8, is an aircraft propulsion system (25) having a FLADE gas turbine engine (1). The engine includes a fan section (115) with at least one row of FLADE fan blades (5) disposed radially outwardly of and drivingly connected to the fan section (115). The row of FLADE fan blades (5) radially extend across a FLADE duct (3) circumscribing the fan section (115). An engine inlet (13) includes a fan inlet (11) to the fan section (115) and an annular FLADE inlet (8) to the FLADE duct (3). A fixed geometry inlet duct (4) is in direct flow communication with the engine inlet (13).

Claim 3 introduces a fan bypass duct (40) that is upstream of the fan section (115) and axially spaced apart first and second counter-rotatable fans (130 and 132) in the fan section (115) and the FLADE fan blades (5) are drivingly connected to one of the first and second counter-rotatable fans (130 and 132).

Claim 4 introduces a row of variable first FLADE vanes (6) disposed axially forwardly of the row of FLADE fan blades (5).

Claim 5 introduces an axially forward row of variable first FLADE vanes (6) and an axially aft row of second FLADE vanes (7) with the row of FLADE fan blades (5) disposed between the first and second FLADE vanes (6, 7).

Claim 8 introduces a core engine (18) located downstream and axially aft of the fan (130) and the fan bypass duct (40) located downstream and axially aft of the fan (130) and circumscribing the core engine (18) with the FLADE duct (3) circumscribing the fan bypass duct (40).

Claim 14 introduces a single direction of rotation fan (330) in the fan section (115).

Claim 41 which depends directly from Claim 1 introduces a two-dimensional convergent/divergent inlet duct passage (111) with convergent and divergent sections (117 and 119) and a throat (121) therebetween within the fixed geometry inlet duct (4). A transition section (9) extends between the two-dimensional convergent/divergent inlet duct passage (111) and the engine inlet (13) in the fixed geometry inlet duct (4).

Claim 48 introduces an aircraft (10) having the gas turbine engine (1) within a fuselage (113) of the aircraft and the fixed geometry inlet duct (4) extending between an air intake mounted flush with respect to the fuselage (113) and the engine inlet (13).

Claim 68 which depends directly from Claim 48 introduces a variable throat area engine nozzle (218) downstream and axially aft of the core engine (18). Claim 68 further introduces cooling apertures (249) in a centerbody (72) and in a wall (220) of the engine nozzle (218) in fluid communication with the FLADE duct (3) and afterburners (224) aft and downstream of the low pressure turbine section (150).

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

ISSUE 1. Claims 1, 3-5, 7, 8, 10-12, 14-22, 41, 43-45, 47, 48, 50-52, 54, 55, 57-59, 61, 63-65, 67, and 68 stand rejected under 35 U.S.C. §102(b) over Johnson (5,404,713) in view of any of Tindell (5,447,283), Creasey et al. (2,956,759), Bullock (3,302,657), and Kerry et al. (2,940,692) and optionally in view of any of EP 0,567,277,A1, Krebs et al. (3,673,802) and Gruner (4,159,624).

ISSUE 2. Claims 1, 3-5, 7, 8, 10-12, 14-22, 41, 43-45, 47, 48, 50-52, 54, 55, 57-59, 61, 63-65, 67, and 68 stand rejected under 35 U.S.C. §103(a) over EP 0,567,277,A1 in view of any of Tindell (5,447,283), Creasey et al. (2,956,759), Bullock (3,302,657), and Kerry et al. (2,940,692) and optionally in view of any of Johnson (5,404,713), Krebs et al. (3,673,802) and Gruner (4,159,624).

#### GROUPING OF CLAIMS

It is Appellant's intention that the rejected Claims 1, 3-5, 7, 8, 10-12, 14-22, 41, 43-45, 47, 48, 50-52, 54, 55, 57-59, 61, 63-65, 67, and 68 stand or fall together in Group 1.

Group 1 includes Claims 1, 3-5, 7, 8, 10-12, 14-22, 41, 43-45, 47, 48, 50-52, 54, 55, 57-59, 61, 63-65, 67, and 68.

#### ARGUMENT

ISSUE 1. Whether Claims 1, 3-5, 7, 8, 10-12, 14-22, 41, 43-45, 47, 48, 50-52, 54, 55, 57-59, 61, 63-65, 67, and 68 are patentable under 35 U.S.C. §102(b) over Johnson (5,404,713) in view of any of Tindell (5,447,283), Creasey et al. (2,956,759), Bullock (3,302,657), and Kerry et al. (2,940,692) and optionally in view of any of EP 0,567,277,A1, Krebs et al. (3,673,802) and Gruner (4,159,624).

ISSUE 2. Whether Claims 1, 3-5, 7, 8, 10-12, 14-22, 41, 43-45, 47, 48, 50-52, 54, 55, 57-59, 61, 63-65, 67, and 68 are patentable under 35 U.S.C. §103(a) over EP 0,567,277,A1 in view of any of Tindell (5,447,283), Creasey et al. (2,956,759), Bullock (3,302,657), and Kerry et al. (2,940,692)



and optionally in view of any of Johnson (5,404,713), Krebs et al. (3,673,802) and Gruner (4,159,624).

The Examiner's grounds for these two rejections state that it would have been obvious to one of ordinary skill in the art to employ a fixed geometry inlet duct of the type found in the secondary references with the gas turbine engine of Johnson or EP 0,567,277,A1, in order to provide a well known type of inlet for the gas turbine engine of Johnson or EP 0,567,277,A1. The Appellant submits that the rejections have no basis in fact or law and is impermissible and the Examiner used hindsight in making the rejection. As pointed out by the Appellant in responses to the Examiner's rejections, the present invention calls out a FLADE engine as disclosed in the primary references Johnson and EP 0,567,277,A1. The FLADE engine is defined as having at least one row of FLADE fan blades disposed radially outwardly of and drivingly connected to the fan section, the row of FLADE fan blades radially extending across a FLADE duct circumscribing the fan section, and an engine inlet including a fan inlet to the fan section and an annular FLADE inlet to the FLADE duct. Both of the primary references clearly state that the FLADE engine is a variable cycle engine. The EP 0,567,277,A1. reference points this out in column 5, lines 7-8. The Johnson reference points this out in column 1, lines 60-66.

The stated purpose of the FLADE fan blades radially extending across a FLADE duct circumscribing the fan section is to avoid the excess sucking and spillage and the resulting decreased ram recovery and spillage drag respectively that is caused by a mismatch between a free stream flow area  $A_0$  and the FLADE engine inlet area  $A_I$  through which the total engine

airflow passes at operating flight conditions that are off design conditions. Johnson clearly teaches that if AI is too small to handle the air, the engine must "suck in" the lacking amount of air resulting in a decreased ram recovery and if AI is too large, the FLADE engine inlet 13 will supply more air than the engine can use resulting in excess drag (spillage drag) because we must either by-pass the excess air around the engine or "spill" it back out of the inlet. Johnson goes on to teach that the inner engine inlet 11 is sized to receive essentially the full airflow 15 of the engine at full power conditions with the FLADE engine inlet 13 essentially closed off by closing the variable first FLADE vanes 6 and the variable second FLADE vanes 7 and that the engine is further designed and operable to fully open the inlet of the FLADE duct at predetermined part power flight conditions and essentially close it at full power conditions such as take off. It would not have been obvious to one of ordinary skill in the art to employ a fixed geometry inlet duct of the types disclosed in the secondary references with the FLADE engine assembly claimed in the present Application in order to provide a well known type of inlet for the gas turbine engine of Johnson as contended by the Examiner because there is no AO and AI relationship as disclosed in the prior art because the inlet duct is between AO and AI. The secondary references teach away from the two primary references because the inlet ducts of the secondary references interfere with flow between the free stream flow area AO and the FLADE engine inlet area AI. In the secondary references AI is not exposed to free stream airflow but rather airflow from within the duct and, thus, there appears to be no reason to combine a FLADE engine with a fixed geometry inlet duct.

The Examiner's Advisory Action dated as mailed January 11, 2006 stated that the Applicant's main argument is that the variable cycle engines of which FLADE is a type is not taught in a single reference with a fixed geometry inlet. The Examiner concluded that such an argument is not persuasive in that fixed geometry inlets are well known for use in gas turbine engines and there is nothing in the references to clearly teach away from using a fixed geometry inlet with a FLADE type engine or any other type of engine. These statements are not true. The Applicant clearly stated that the primary and secondary references fail to even suggest such a combination. The Examiner has taken the elements of the primary and secondary references and the invention out of context and completely ignored the differences between the elements of the FLADE type engines and the engines disclosed in the secondary references. The Examiner failed to take into consideration differences in construction, functionality, operation and cooperation of the FLADE fan with the engine's inlet. The purposes of the FLADE type engines are contrary to the purposes of the fixed geometry inlets and the secondary references seem to inhibit the operation of FLADE type engine. The Examiner failed to address these issues when they were raised by the Applicant.

The Examiner contends that motivation to combine includes the following reasons.

"Tindell teaches a fixed geometry inlet duct 2 in direct flow communication with the engine 8 inlet with benefits including fluidic variable inlet control and enhanced inlet performance (col. 2, lines 38-44) and reduced separation and allowing optimization of surge margin

(col. 5, lines 1-12) as well as enhanced handling of supersonic flows into the inlet. Creasey et al. teach a fixed geometry inlet duct 130 in direct flow communication with the engine inlet 155; further comprising the fixed geometry inlet duct having a two-dimensional convergent/divergent inlet duct passage with convergent and divergent sections, and a throat therebetween and a transition section between the two-dimensional convergent/divergent inlet duct passage and the engine inlet where the engine is a turbojet engine (col. 1, lines 26+) as well as enhanced handling of supersonic flows into the inlet. Creasey teaches the inlet is isentropic (col. 3, circa line 46), i.e. with minimal losses, as well as enhanced handling of supersonic flows into the inlet. Bullock teach a fixed geometry inlet duct 2 in direct flow communication with the engine 12 inlet; further comprising the fixed geometry inlet duct having a two-dimensional (rectangular, col. 2, lines 30+) convergent/divergent inlet duct passage with convergent and divergent sections, and a throat therebetween and a transition section between the two-dimensional convergent/divergent inlet duct passage and the engine inlet 12 where the engine is a gas turbine engine (col. 3, lines 7+) and benefits include the ability to control the inlet flow as well as enhanced handling of shock waves (col. 1, lines 1-30) as well as enhanced handling of supersonic flows into the inlet. Kerry et al. teach a fixed geometry inlet duct 37 in direct flow communication with the engine inlet to from a smooth continuation of the inlet of the engine (col. 3, lines 8+). Reasons for combining

include providing a well known type of inlet for the gas turbine engine of Johnson et al. with advantages including reduced flow losses and/or to allow control the inlet flow as well as enhanced handling of shock waves and/or to provide a smooth streamlined inlet and/or enhanced handling of supersonic flows into the inlet."

The Examiner stated that Tindell teaches variable geometry inlets for gas turbines are known in the art (col. 1, lines 13-24, 50-60) and that his improvement is a fixed geometry inlet with variable boundary layer control, i.e. fluidic control over the inlet fib, which allows optimized engine performance (col. 6, lines 31-35). If Tindell is blowing air in the fixed geometry duct then why would anyone of ordinary skill in the art connect it to a FLADE engine which sucks air into the radially outermost portion of engine inlet thus most likely sucking and thus effecting the boundary layer. Furthermore, why would anyone of ordinary skill in the art use a FLADE engine with such an inlet since the fixed geometry inlet prevents the stated benefits of the FLADE engine from being obtained. One of ordinary skill in the art would not use a FLADE engine with a fixed geometry inlet because the added complexity and costs associated with the FLADE fan clearly would not provide any of the known benefits of the FLADE engine.

The Examiner contends that it would have been obvious to one of ordinary skill in the art to combine the primary references teaching FLADE engines with the secondary references teaching the various fixed geometry inlet ducts but fails to give a technically valid reason or motivation to combine the references as required by the MPEP and the law.

The Examiner has failed to address the fact that the secondary references relied upon to show fixed inlet ducts were attached to non-variable cycle engines and that the present Application and the two primary references, Johnson and EP 0,567,277,A1, expressly call out FLADE engines which are described in the specification and in the EP 0,567,277,A1 reference as being a variable cycle engine. Contrary to the Examiner's conclusion, it would not have been obvious to one of ordinary skill in the art to employ a fixed geometry inlet duct with the configuration above, in order to provide a well known type of inlet for the gas turbine engine of Johnson et al. with advantages including reduced flow losses and/or to allow control the inlet flow as well as enhanced handling of shock waves and/or to provide a smooth streamlined inlet and/or enhanced handling of supersonic flows into the inlet because nothing in the prior art shows that fixed geometry inlet ducts work efficiently or can handle airflow into variable cycle engines let alone FLADE engines and in fact all of the secondary references show only non-variable cycle engines together with fixed ducts. The absence of fixed geometry inlet ducts used in conjunction with variable cycle engines in the prior art speaks volumes. One of ordinary skill in the art must ask if no fixed geometry inlet ducts are used in conjunction with variable cycle engines and why use it with a variable cycle FLADE engine. The Examiner has failed to explain why one of ordinary skill in the art would use a FLADE engine with all of their additional complexity, parts, and apparent costs, as compared to non FLADE engine, in combination with a fixed geometry inlet duct when the fixed geometry inlet duct seems to negate the reasons taught in the prior art for using a FLADE engine and none of the prior art

discloses a fixed geometry inlet duct or any kind of inlet duct in combination with a FLADE engine. One can only conclude that the Examiner used impermissible hindsight to make the combination for the 103 rejections.

The court clearly teaches us that a conclusion of obviousness is an error when it is not accompanied by a clearly elucidated factual teachings, suggestions, or incentives from this prior art that shows the propriety of combination. Here, the Examiner has combined the primary and secondary references without any valid technical reason disclosed or even suggested in the prior art in spite of reasons not to combine and that the secondary references teach away from the primary references and the present invention. The Examiner has ignored the Applicant's argument that variable cycle engines are different from the engines disclosed in the secondary prior art references and that in fact the Examiner could not find one instance of a variable cycle engine employing a fixed duct and that in fact the prior art teaches against using fixed ducts with variable cycle engines. The Examiner has taken the primary references and teachings out of context instead of treating them as a whole and failed to address the Applicant's argument that one skilled in the art would not combine a variable cycle engine with a fixed geometry inlet duct.

The CAFC in re Rouffet (CAFC) 47 USPQ2d 1453 (7/15/1998) stated "To prevent the use of hindsight based on the invention to defeat patentability of the invention, this court requires the examiner to show a motivation to combine the references that create the case of obviousness." In other words, the Examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no

knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed. The court stated "the Board must explain the reasons one of ordinary skill in the art would have been motivated to select the references and to combine them to render the claimed invention obvious. The Board's naked invocation of skill in the art to supply a suggestion to combine the references cited in this case is therefore clearly erroneous. Absent any proper motivation to combine part of Levine's teachings with Freeburg's satellite system, the rejection of Rouffet's claim over these references was improper and is reversed."

A claimed invention may be found to have been obvious if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. The Examiner has taken the engine in the secondary references out of context and has not treated the secondary references as a whole, namely the fixed geometry inlet ducts and the non-variable cycle engines disclosed therein and would have one believe there are no differences that effect the operation of a FLADE engine combined with a fixed geometry duct as taught in the prior art. This is not true as proven above. The MPEP in section 2143.01, Suggestion or Motivation To Modify the References, clearly states "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed.



Cir. 2000). In *In re Fulton*, 391 F.3d 1195, 73 USPQ2d 1141 (Fed. Cir. 2004), the court stated that the proper inquiry is "whether there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination". Obviousness may only be found where the Examiner has shown that a person having ordinary skill in the art at the time of the invention viewing the subject matter as a whole would have combined the primary and secondary references the Examiner clearly has not done this and has not taken the prior art as a whole even when the Appellant pointed this out.

The Appellant also would like point out that the same section of the MPEP states:

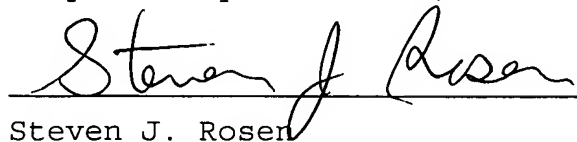
"In *In re Kotzab*, the claims were drawn to an injection molding method using a single temperature sensor to control a plurality of flow control valves. The primary reference disclosed a multizone device having multiple sensors, each of which controlled an associated flow control valve, and also taught that one system may be used to control a number of valves. The court found that there was insufficient evidence to show that one system was the same as one sensor. While the control of multiple valves by a single sensor rather than by multiple sensors was a "technologically simple concept," there was no finding "as to the specific understanding or principle within the knowledge of the skilled artisan" that would have provided the motivation to use a single sensor as the system to control more than one valve. 217 F.3d at 1371, 55 USPQ2d at 1318."

The Appellant respectfully submits that the Examiner's

combination of prior art and subsequent rejections have been overcome by the arguments above and that the present Claims are patentable over the combination of cited references because of the differences between the prior art and the Claims at issue. The prior art cited by the Examiner fails to teach a particular combination which results in the claimed invention and the combination fails to show any purposes consistent with the present invention or reason why one skilled in the art should make the combination.

In summary, it is submitted that not one of the references or any combination thereof describes or suggests the Appellant's invention or how its benefits could be obtained. The Appellant respectfully submits that the Examiner has not shown the appealed Claims 1, 3-5, 7, 8, 10-12, 14-22, 41, 43-45, 47, 48, 50-52, 54, 55, 57-59, 61, 63-65, 67, and 68 to be obvious, in light of the cited references, and asks that the Board overturn the Examiner's rejection and allow all Claims under appeal.

Respectfully submitted,

A handwritten signature in cursive script, reading "Steven J. Rosen", written over a horizontal line.

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August 9, 2006

CLAIMS APPENDIX

CLAIMS UNDER APPEAL

Claim 1. An aircraft propulsion system comprising:

- a gas turbine engine comprising;
- a fan section,
- at least one row of FLADE fan blades disposed radially outwardly of and drivingly connected to the fan section,
- the row of FLADE fan blades radially extending across a FLADE duct circumscribing the fan section,
- an engine inlet including a fan inlet to the fan section and an annular FLADE inlet to the FLADE duct, and
- a fixed geometry inlet duct in direct flow communication with the engine inlet.

Claim 3. (amended) A propulsion system as claimed in claim 1 wherein the fan section is upstream of a fan bypass duct, includes axially spaced apart first and second counter-rotatable fans, and the FLADE fan blades are drivingly connected to one of the first and second counter-rotatable fans.

Claim 4. A propulsion system as claimed in claim 1 further comprising a row of variable first FLADE vanes disposed axially forwardly of the row of FLADE fan blades.

Claim 5. A propulsion system as claimed in claim 1 further comprising the row of FLADE fan blades disposed between an axially forward row of variable first FLADE vanes and an axially aft row of second FLADE vanes.

Claim 7. (amended) A propulsion system as claimed in claim 4 wherein the fan section is upstream of a fan bypass duct, includes axially spaced apart first and second counter-rotatable fans, and the FLADE fan blades are drivingly connected to one of the first and second counter-rotatable fans.

Claim 8. (amended) A propulsion system as claimed in claim 1 further comprising:

- a core engine located downstream and axially aft of the fan,

- a fan bypass duct located downstream and axially aft of the fan and circumscribing the core engine, and

- the FLADE duct circumscribing the fan bypass duct.

Claim 10. (amended) A propulsion system as claimed in claim 8 wherein the fan section is upstream of the fan bypass duct, includes axially spaced apart first and second counter-rotatable fans, and the FLADE fan blades are drivingly connected to one of the first and second counter-rotatable fans.

Claim 11. A propulsion system as claimed in claim 8 further comprising a row of variable first FLADE vanes disposed axially forwardly of the row of FLADE fan blades.

Claim 12. A propulsion system as claimed in claim 8 further comprising the row of FLADE fan blades disposed between an axially forward row of variable first FLADE vanes and an axially aft row of second FLADE vanes.

Claim 14. (amended) A propulsion system as claimed in claim 11 wherein the fan section is upstream of the fan bypass duct, includes axially spaced apart first and second counter-rotatable fans, and the FLADE fan blades are drivingly connected to one of the first and second counter-rotatable fans.

Claim 15. A propulsion system as claimed in claim 14 further comprising:

- the core engine having in serial flow relationship a row of core driven fan stator vanes, a core driven fan with at least one row of core driven fan blades, a high pressure compressor, a combustor, and a high pressure turbine drivingly connected to the core driven fan,

- the first and second counter-rotatable fans are radially disposed across an annular first fan duct,

- first and second low pressure turbines drivingly connected to the first and second counter-rotatable fans,

- the core driven fan is radially disposed across an annular second fan duct,

- a vane shroud dividing the core driven fan stator vanes into radially inner and outer vane hub and tip sections,

- a fan shroud dividing the core driven fan blades into radially inner and outer blade hub and tip sections,

- a first bypass inlet to the fan bypass duct is disposed axially between the second counter-rotatable fan and the annular core engine inlet to the core engine,

- a fan tip duct across the vane tip sections of the core driven fan stator vanes and across the blade tip sections of the core driven fan blades extending to a second bypass inlet

to the fan bypass duct, and

a first varying means for independently varying a flow area of the vane tip section.

Claim 16. A propulsion system as claimed in claim 15 further a second varying means for independently varying a flow area of the vane hub section.

Claim 17. A propulsion system as claimed in claim 16 wherein the first and second varying means include independently varying vane tip sections and independently varying vane hub sections respectively.

Claim 18. A propulsion system as claimed in claim 17 further comprising a front variable area bypass injector door in the first bypass inlet.

Claim 19. A propulsion system as claimed in claim 15 further comprising:

the row of FLADE fan blades disposed radially outwardly of and drivingly connected to the second counter-rotatable fan,

the high pressure turbine having a row of high pressure turbine nozzle stator vanes axially located between the combustor and a row of high pressure turbine blades of the high pressure turbine,

the row of high pressure turbine blades being counter-rotatable to the first low pressure turbine,

a row of variable low pressure stator vanes between first and second rows of low pressure turbine blades of the first and second low pressure turbines respectively, and

the row of high pressure turbine nozzle stator vanes, the row of high pressure turbine blades, the first row of low pressure turbine blades, the row of variable low pressure stator vanes, and the second row of low pressure turbine blades being in serial axial and downstream relationship.

Claim 20. A propulsion system as claimed in claim 15 further comprising:

the high pressure turbine having a row of high pressure turbine nozzle stator vanes axially located between the combustor and a row of high pressure turbine blades of the high pressure turbine,

the row of high pressure turbine blades being counter-rotatable to the first low pressure turbine,

a row of fixed stator vanes between the row of high pressure turbine blades and the first low pressure turbine,

no vanes between the first and second rows of low pressure turbine blades of the first and second low pressure turbines respectively, and

the row of high pressure turbine nozzle stator vanes, the row of high pressure turbine blades, the row of fixed stator vanes, the first row of low pressure turbine blades, and the second row of low pressure turbine blades being in serial axial and downstream relationship.

Claim 21. A propulsion system as claimed in claim 15 further comprising:

the second counter-rotatable fan having axially spaced apart rows of first and second stage blades and a row of second stage fan vanes therebetween,

the row of FLADE fan blades disposed radially outwardly

of and drivingly connected to the row of second stage blades,  
the high pressure turbine having a row of high pressure turbine nozzle stator vanes axially located between the combustor and a row of high pressure turbine blades of the high pressure turbine,

the row of high pressure turbine blades being counter-rotatable to the first low pressure turbine,

a row of fixed stator vanes between the row of high pressure turbine blades and the first low pressure turbine,

no vanes between the first and second rows of low pressure turbine blades of the first and second low pressure turbines respectively, and

the row of high pressure turbine nozzle stator vanes, the row of high pressure turbine blades, the row of fixed stator vanes, the first row of low pressure turbine blades, and the second row of low pressure turbine blades being in serial axial and downstream relationship.

Claim 22. A propulsion system as claimed in claim 15 further comprising:

the second counter-rotatable fan having axially spaced apart rows of first and second stage blades and a row of second stage fan vanes therebetween,

the row of FLADE fan blades disposed radially outwardly of and drivingly connected to the row of second stage blades,

the high pressure turbine having a row of high pressure turbine nozzle stator vanes axially located between the combustor and a row of high pressure turbine blades of the high pressure turbine,

the row of high pressure turbine blades being counter-rotatable to the first low pressure turbine,



a row of variable low pressure stator vanes between first and second rows of low pressure turbine blades of the first and second low pressure turbines respectively, and

the row of high pressure turbine nozzle stator vanes, the row of high pressure turbine blades, the first row of low pressure turbine blades, the row of variable low pressure stator vanes, and the second row of low pressure turbine blades being in serial axial and downstream relationship.

Claim 41. A propulsion system as claimed in claim 1 further comprising the fixed geometry inlet duct having a two-dimensional convergent/divergent inlet duct passage with convergent and divergent sections, and a throat therebetween and a transition section between the two-dimensional convergent/divergent inlet duct passage and the engine inlet.

Claim 43. (amended) A propulsion system as claimed in claim 41 wherein the fan section is upstream of a fan bypass duct, includes axially spaced apart first and second counter-rotatable fans, and the FLADE fan blades are drivingly connected to one of the first and second counter-rotatable fans.

Claim 44. A propulsion system as claimed in claim 41 further comprising a row of variable first FLADE vanes disposed axially forwardly of the row of FLADE fan blades.

Claim 45. A propulsion system as claimed in claim 41 further comprising the row of FLADE fan blades disposed between an axially forward row of variable first FLADE vanes and an axially aft row of second FLADE vanes.

Claim 47. (amended) A propulsion system as claimed in claim 44 wherein the fan section is upstream of a fan bypass duct, includes axially spaced apart first and second counter-rotatable fans, and the FLADE fan blades are drivingly connected to one of the first and second counter-rotatable fans.

Claim 48. An aircraft comprising:

- a gas turbine engine within a fuselage of the aircraft,
- the gas turbine engine comprising;
- a fan section,
- at least one row of FLADE fan blades disposed radially outwardly of and drivingly connected to the fan section,
- the row of FLADE fan blades radially extending across a FLADE duct circumscribing the fan section, and
- an engine inlet including a fan inlet to the fan section and an annular FLADE inlet to the FLADE duct; and
- a fixed geometry inlet duct extending between an air intake mounted flush with respect to the fuselage and the engine inlet.

Claim 50. (amended) An aircraft as claimed in claim 48 wherein the fan section is upstream of a fan bypass duct, includes axially spaced apart first and second counter-rotatable fans, and the FLADE fan blades are drivingly connected to one of the first and second counter-rotatable fans.

Claim 51. An aircraft as claimed in claim 48 further comprising a row of variable first FLADE vanes disposed

axially forwardly of the row of FLADE fan blades.

Claim 52. An aircraft as claimed in claim 48 further comprising the row of FLADE fan blades disposed between an axially forward row of variable first FLADE vanes and an axially aft row of second FLADE vanes.

Claim 54. (amended) An aircraft as claimed in claim 51 wherein the fan section is upstream of a fan bypass duct, includes axially spaced apart first and second counter-rotatable fans, and the FLADE fan blades are drivingly connected to one of the first and second counter-rotatable fans.

Claim 55. An aircraft as claimed in claim 48 further comprising:

- a core engine located downstream and axially aft of the fan,

- a fan bypass duct located downstream and axially aft of the fan and circumscribing the core engine, and

- the FLADE duct circumscribing the fan bypass duct.

Claim 57. (amended) An aircraft as claimed in claim 55 wherein the fan section is upstream of the fan bypass duct, includes axially spaced apart first and second counter-rotatable fans, and the FLADE fan blades are drivingly connected to one of the first and second counter-rotatable fans.

Claim 58. An aircraft as claimed in claim 55 further comprising a row of variable first FLADE vanes disposed

axially forwardly of the row of FLADE fan blades.

Claim 59. An aircraft as claimed in claim 55 further comprising the row of FLADE fan blades disposed between an axially forward row of variable first FLADE vanes and an axially aft row of second FLADE vanes.

Claim 61. An aircraft as claimed in claim 48 further comprising the fixed geometry inlet duct having a two-dimensional convergent/divergent inlet duct passage with convergent and divergent sections, and a throat therebetween and a transition section between the two-dimensional convergent/divergent inlet duct passage and the engine inlet.

Claim 63. (amended) An aircraft as claimed in claim 61 wherein the fan section is upstream of a fan bypass duct, includes axially spaced apart first and second counter-rotatable fans, and the FLADE fan blades are drivingly connected to one of the first and second counter-rotatable fans.

Claim 64. An aircraft as claimed in claim 61 further comprising a row of variable first FLADE vanes disposed axially forwardly of the row of FLADE fan blades.

Claim 65. An aircraft as claimed in claim 61 further comprising the row of FLADE fan blades disposed between an axially forward row of variable first FLADE vanes and an axially aft row of second FLADE vanes.

Claim 67. (amended) An aircraft as claimed in claim 64

wherein the fan section is upstream of a fan bypass duct, includes axially spaced apart first and second counter-rotatable fans, and the FLADE fan blades are drivingly connected to one of the first and second counter-rotatable fans.

Claim 68. An aircraft as claimed in claim 48 further comprising:

a variable throat area engine nozzle downstream and axially aft of the core engine,

cooling apertures in the centerbody and in a wall of the engine nozzle in fluid communication with the FLADE duct, and

afterburners aft and downstream of the low pressure turbine section.

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EVIDENCE APPENDIX

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RELATED PROCEEDINGS APPENDIX

NONE